

Lösung:

- a) Suppose that the white ball has velocity v before the collision and let v_1, v_2 denote the velocities of the balls after the collision. Conservation of energy gives $v^2 = v_1^2 + v_2^2$. Conservation of momentum gives $\vec{v} = \vec{v}_1 + \vec{v}_2$. By Pythagoras, the angle α thus has to be 90° .
- b) There is no solution without any ball colliding with a wall. The trajectories of the balls correspond to straight lines if we include the mirror image of the table mirrored along the wall where the collision occurs. Then the black ball has to lie on the Thales circle between the hole where it falls into and its mirror image.

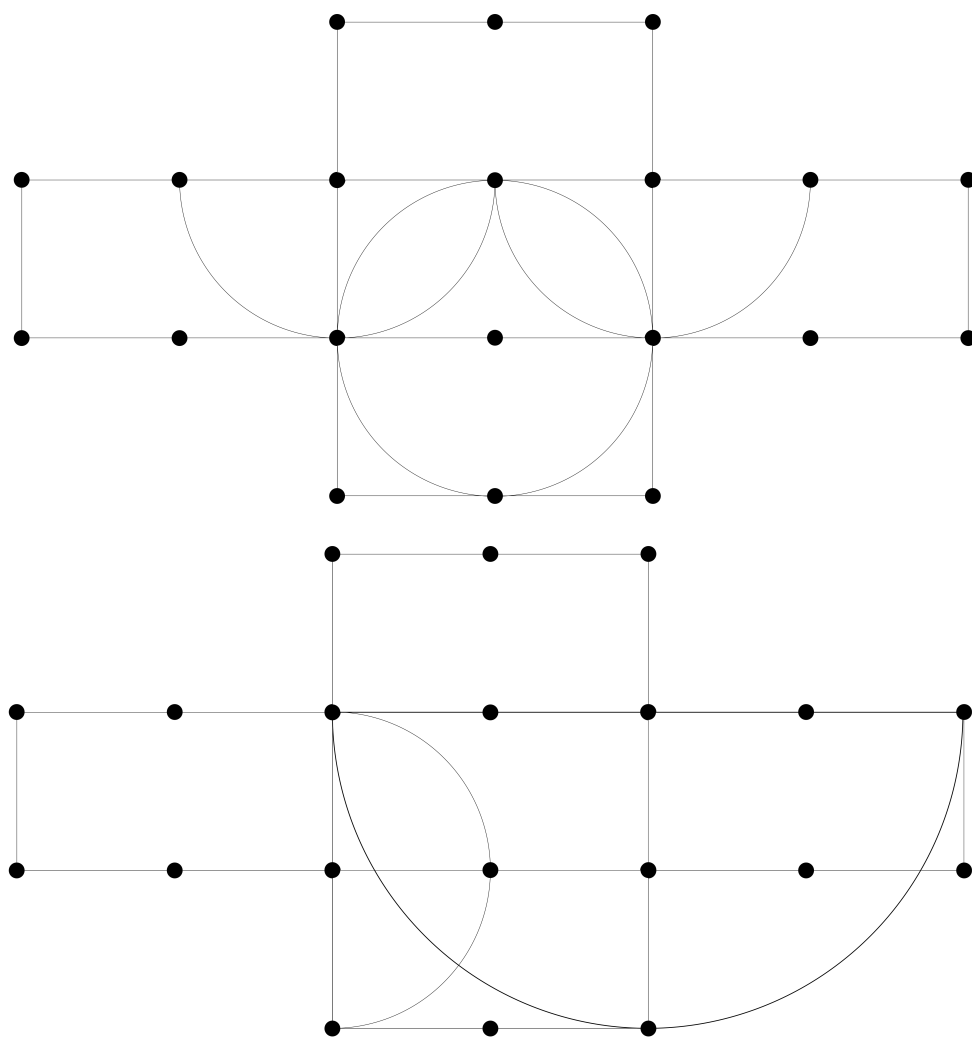


Figure 3: The solution for the hole in the middle of the upper edge and for the hole in the upper left corner.